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(तीसरा पुनरीक्षण)

Indian Standard

INK, DUPLICATING, FOR TWIN CYLINDER ROTARY MACHINES - SPECIFICATION

(Third Revision)

UDC 667.53

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1992

Price Group 3

Stationery and Allied Products Sectional Committee, CHD 014

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Stationery and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard was originally published in 1957 and was subsequently revised twice in 1969 and 1973. In the first revision, emulsion-based inks were included as it had been found that only such type of inks were suitable for the purpose. The requirement of freedom from smudginess was incorporated and methods of test for performance and evaluating strick-through, offset and drying time were modified. In the second revision, requirement of fineness of dispersion and its method of test was included. In the present third revision of the standard, requirements of keeping quality and packaging, and method of test for stability have been modified. It also incorporates Amendment No. 1 which was issued in 1980.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 JUNE 2005
TO
IS 1222 : 1992 INK, DUPLICATING, FOR TWIN CYLINDER ROTARY MACHINES — SPECIFICATION

(Third Revision)

(*Page* 1, *clause* **1**) — Substitute the following for the existing text:

'This standard prescribes requirements, methods of sampling and test for ink, duplicating for twin cylinder rotary machines for taking prints using of a duly cut stencil paper by a pica type typewriter.'

(*Page* 2, *Annex* A, *clause* **A-1**) — Substitute 'A' *for* 'An electrically- operated'

(*Page* 2, *Annex* A, *clause* **A-2**) — Substitute 'IS 5086 1993' *for* 'IS 5086 1981'.

(*Page* 2, *Annex* A, *clause* **A-4.1,** *line* 13) — Substitute 'gently' *for* 'at a speed of 60 sheets per minute'.

(CHD 14)

Reprography Unit, BIS, New Delhi, India

Indian Standard

INK, DUPLICATING, FOR TWIN CYLINDER ROTARY MACHINES - SPECIFICATION

(Third Revision)

1 SCOPE

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Stationery and Allied Products Sectional Committee had been approved by the Chemical Division Council.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	*Title*
1056 : 1965	Commercial metric weights (*revised*)
1763 : 1961	Substances of paper and pulp board
1848 : 1981	Writing and printing paper (*second revision*)
2837 : 1964	Porcelain crucibles and basins
4395 : 1987	Glossary of terms relating to inks and allied industries (*first revision*)
4905 : 1968	Methods of random sampling
5086 : 1981	Stencil paper (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4395 : 1987 shall apply.

4 REQUIREMENTS

4.1 Description

The material shall be in the form of a paste and shall be free from grit and other objectionable matter, such as skins, lumps and other separated materials. It shall also be free from phase separation when examined visually. It shall not possess a disagreeable odour.

4.2 Colour

The colour may be as agreed to between the purchaser and the supplier.

4.3 Composition

The ink shall be emulsion-based which shall be adjudged by the test prescribed in **8.2**.

4.4 Consistency

The consistency of the material shall be such that it shall be capable of easy distribution on the cylinders of the machine prescribed in **A-1** after a few revolutions of the cylinders. It shall neither run or drip-off the cylinders nor shall it be so stiff as to be difficult to distribute on the cylinders.

4.5 Stability

The ink shall be workable in all weather and shall satisfy the test prescribed in **8.3**.

4.6 Performance

The performance of the material shall be such that it passes the tests prescribed in **A-4.1** and **A-4.4**.

4.7 Strike-Through and Offset

The ink shall not exhibit any strike-through or offset when examined as prescribed in **A-4.2**.

4.8 Smudginess

Impressions obtained with the ink shall not smudge after drying when tested by the method prescribed in **A-4.3**.

4.9 Fineness of Dispersion

When tested for fineness of dispersion of pigment particles in the medium by the method prescribed in Annex B, the material shall not be coarser than 15 microns on the Hegman scale or equivalent.

5 KEEPING QUALITY

The material shall be in workable condition for at least two years from the date of manufacture and shall satisfy all the requirements as prescribed in **4** when stored under normal conditions.

6 PACKAGING AND MARKING

6.1 Packaging

The material shall be packed in aluminium/lead collapsible tubes, each containing 400 g net mass of the material or as agreed to between the purchaser and the supplier.

6.2 Marking

The containers shall be securely closed and marked with the following information:

a) Indication of the source of manufacture,

b) Name and colour of the material,

c) Net mass of the material in the tube, and

d) Lot number to enable the batch and date of manufacture to be traced from records.

6.2.1 The containers may also be marked with the Standard Mark.

7 SAMPLING

Representative samples of the material shall be drawn and adjudged as precribed in Annex C.

8 TEST METHODS

8.1 Tests for the requirements prescribed in **4.3**, **4.4**, **4.5**, **4.6**, **4.7**, **4.8** and **4.9** shall be carried out as prescribed in **8.2**, **8.3** and Annexes A and B of this standard.

8.2 Test for Emulsion

Take a glass panel and squeeze out two or three drops of ink on it. Take another glass panel, put it on top of the first panel and rub it to and fro. The appearance of phase separation shall indicate that the ink is emulsion-based.

8.3 Test for Stability

Take 10 g of the material in a rounded-bottom porcelain basin of 75 ml capacity (*see* IS 2837 : 1964) and keep it at a temperature of 0°C for three hours. The material shall show no signs of congealing and shall remain of workable consistency. Keep the material in a similar manner at a temperature of 60 ± 2°C for three hours. It shall not change its consistency appreciably or show signs of separation of oil layer or any appreciable signs of bubbles.

ANNEX A

(*Clauses* 4.4*,* 4.6, 4.7, 4.8 *and* 8.1)

METHODS OF TEST FOR INK, DUPLICATING, FOR TWIN CYLINDER ROTARY MACHINES

A-1 DUPLICATING MACHINE

An electrically-operated twin-cylinder rotary type duplicating machine, capable of taking up paper of maximum width of 230 mm shall be used.

A-2 STENCIL PAPER

The stencil paper conforming to IS 5086 : 1981 shall be used.

A-3 DUPLICATING PAPER

A-3.1 White, duplicating, semi-absorbent paper (*see* Sl No. 23 of Table 1 of IS 1848 : 1981) having a substance of 75 g/ml^2 with a tolerance of ± 2.5 percent (*see* IS 1763 : 1961) shall be used.

A-4 PROCEDURE

A-4.1 Test for Performance

Clean carefully the machine, the screen, the impression roller and the inked roller and put them in proper position on the machine. Cut on the stencil (*see* **A-2**) 25 lines of typed matter, each 15 cm long using all the letters, capitals and lower case, along with numerals and symbols. The stencil shall be cut with freshly cleaned pica type typewriter. Apply 20 g of the ink on the cylinder and run the machine till the ink spreads evenly on the rollers. Put the stencil securely in position, apply 15 g of the ink and again run the machine at a speed of 60 sheets per minute to obtain 200 copies. The material shall pass the performance test if a minimum of 200 clear and legible copies are obtained.

A-4.1.1 Repeat the test using 15 g of ink by cyclostyling 100 sheets on both sides.

A-4.2 Examine all the copies excluding the first five copies. The ink shall not exhibit and strike-through and offset sufficient to interfere with the legibility of the finished work on either side of the paper.

A-4.2.1 When the printed copies are stacked, there shall be no objectionable transfer of ink from one sheet to the other.

A-4.3 Test for Smudginess

Take the printed sheet which has been allowed to dry for two minutes and place it on a smooth flat surface with the printed side up and cover with a clean sheet of the duplicating paper. Place a 100-g weight of 24 mm diameter (*see* IS 1056 :1965) on one edge of the paper and draw the clean sheet of the duplicating paper and weigh slowly across the printed sheet. Repeat this test twice and examine after each test. The material shall be considered to have passed the test if there is no smudging or spreading of the ink on the paper.

A-4.4 Store the stencil used in **A-4.1,** without cleaning it, in between the two sheets of blotting paper. After 15 days, use this stencil again as prescribed in **A-4.1,** using 30 g of the ink. The material shall be considered to have passed the test if a minimum of 100 clear and legible copies are obtained before fading starts.

ANNEX B

(*Clauses* 4.9 *and* 8.1)

DETERMINATION OF FINENESS OF DISPERSION

B-1 GENERAL

Fineness of dispersion is measured on a grind gauge generally known as Hegman gauge, consisting of a block of hardened steel into which has been machined a shallow groove varying in depth from zero at one end to 0.102 mm at the other. A sample of ink is plated at the deep end and is drawn down towards the shallow end by a steel scraper. Observation of any scratches in the ink film and where they occur in terms of distance along the gauge gives a measure of the degree of dispersion in the ink sample.

B-2 APPARATUS

B-2.1 Gauge (Hegman Gauge)

A hardened steel block approximately 180 mm in length, 63.5 mm in width and 12.5 mm in thickness. The top surface of the block shall be ground smooth and flat, and shall contain a groove 133.4 mm in length and 12.5 mm in width, centred in the top of the block. The groove shall be tapered uniformly in depth lengthwise from 0.102 mm at one end to zero depth at the other, calibrated with a scale number in accordance with its depth as given in Table 1.

NOTE — The apparatus may also be of a double channel type for comparing another sample

B-2.2 Scraper

A double-edged steel blade 87.5 mm long, 37.5 mm wide and 6.8 mm thick. The two edges along the length shall be rounded to a radius of approximately 0.25 mm.

B-3 PROCEDURE

B-3.1 Place the gauge on a flat, nonslippery, surface, and wipe it clean immediately before the test Place the material to be tested in the deep end of the groove so that it overflows the groove slightly Care shall be taken to see that the sample is free of air bubbles. Using both hands hold the blade perpendicular to the block surface and at right angles to the length of the groove and draw the material down the length of the groove with a uniform deliberate motion. Use sufficient pressure to clean the level face of the gauge. Immediately read the fineness as follows.

a) View the gauge from the side so that the line of vision is at right angles to the longer dimension of the groove.

b) Hold the gauge in light that will make the pattern readily visible

c) For actual reading, make the angle between the face of the gauge and the line of vision neither more than 30°C nor less than 20°C.

d) Interpret the pattern and designate dispersion in microns or scale number, ignoring the few isolated and irregularly spaced particles towards the deep end of the groove.

Using a fresh sample of the material each time, obtain three readings in the like manner. The first drawdown and reading is preliminary in order to establish proper conditions and to locate the fineness pattern. With this known, the second and third readings can be made with a minimum time lapse between completion of drawdown and actual reading. No reading shall be considered for reporting fineness when the time lapse exceeds 10 seconds.

B-3.2 Care of Gauge

The gauge shall be immediately cleaned after each reading. Use a solvent and a soft cloth. Keep the gauge covered at all times when not in use. Gauges that lie idle for extended periods of time shall be protected from rust. Do not allow any hard materials to come in contact with the gauge surface or scrapper in any manner that might result in scarring or nicking. Tapping or scratching with other metallic surfaces shall be avoided. The scraper edge may be rendered unsatisfactory for use by wear of the contact edge or by warpage.

NOTE — Wear or warpage of the scraper may be noted by facing the edge of the scraper down on the smooth level face of the gauge and then inspecting the contact edge by means of a strong light, placed behind the gauge. Rocking the scraper forward or backward will reveal poor contact due to wear or warpage. If any face shows that the scraper has been damaged, it shall not be used.

Table 1 Relationship Between Depth of Tapered Groove and Scale for Fineness of Grinding

(*Clause* B-2.1)

Distance from Zero End mm	Depth microns	Hegman Scale
133.350	102	Well for sample
127	102	0
111.125	89	1
95.250	76	2
79.375	64	3
63.500	51	4
47.625	38	5
31.730	25	6
15.875	13	7
0	0	8

ANNEX C

(*Clause* 7)

SAMPLING OF INK, DUPLICATING, FOR TWIN CYLINDER ROTARY MACHINES

C-1 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparing, storing and handling test samples the following precautions and directions shall be observed.

C-1.1 Samples shall be drawn from originally unopened tubes.

C-1.2 Samples shall not be taken in an exposed places.

C-1.3 Each sample container shall be marked with full details of sampling and the month and year of the manufacture of the material.

C-2 SCALE OF SAMPLING

C-2.1 All the tubes in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist different batches of manufacture, the tubes belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

C-2.1.1 Samples of duplicating ink shall be tested from each lot for ascertaining the conformity of the material to the requirements of the specification.

C-2.2 The number (n) of tubes to be chosen from the lot shall depend upon the size of the lot and shall be in accordance with Table 2.

Table 2 Number of Tubes to be Selected for Sampling

Lot Size N	No. of Tubes to be Chosen n
Up to 50	2
51 to 100	3
101 to 300	4
301 and above	5

C-2.3 These tubes shall be chosen at random from the lot. In order to ensure randomness of selection, random sampling procedures as given in IS 4905 : 1968 may be followed.

C-3 NUMBER OF TESTS

C-3.1 For each of the tube selected, sufficient quantity of ink shall be collected as and when the tests are made. Tests for emulsion, stability and performance shall be conducted separately for each of the selected tubes.

C-4 CRITERIA FOR CONFORMITY

C-4.1 The lot shall be declared to have complied with the requirements of the specification if all the individual tests in respect of different characteristics give satisfactory results.

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